

Claims

1. A lithographic projection assembly, comprising:
at least one load lock constructed and arranged to transfer an object between a first environment and a second environment;
an object handler comprising a handler chamber in which said second environment prevails, said object handler and said at least one load lock being constructed and arranged to transfer said object between said object handler and said at least one load lock; and
a lithographic projection apparatus comprising a projection chamber;
wherein said handler chamber and projection chamber can communicate for transferring of said object between said handler chamber and said projection chamber, and wherein said load lock comprises a load lock chamber which is provided with at least two mutually distinct object supports.
2. An assembly according to claim 1, wherein said second environment has a lower pressure than said first environment.
3. An assembly according to claim 2, wherein said load lock further comprises evacuation devices constructed and arranged to evacuate said load lock chamber.
4. An assembly according to claim 2, wherein said load lock further comprises door devices constructed and arranged to close said load lock chamber during evacuation and to open said load lock chamber to permit said object to be positioned into said load lock chamber and to respectively permit said object to be removed from said load lock chamber.
5. An assembly according to claim 1, wherein said load lock comprises volume decreasing devices constructed and arranged to decrease said gas volume.
6. An assembly according to claim 5, wherein said volume decreasing devices are adapted to decrease said gas volume adjacent said surface of said object positioned on at least one of said object supports.

7. An assembly according to claims 5, wherein said at least one of said object supports comprises a support plate of a size about equal to or larger than said object to be supported, wherein a ceiling plate is provided above said at least one of said object supports, said ceiling plate having a size of about equal to or larger than said object; and wherein said volume decreasing devices comprise a positioning device constructed and arranged to decrease the distance between said support plate and said ceiling plate prior to and/or during evacuation of said load lock chamber and to increase said distance between said support plate and said ceiling plate prior to said object being removed from or delivery to said at least one of said object supports.
8. An assembly according to claim 7, wherein said positioning devices are adapted to act on one of said support plate and said ceiling plate, while the other of said support plate and said ceiling plate is arranged in a stationary manner in said load lock chamber.
9. An assembly according to claim 7, wherein said positioning devices are provided at sides of said load lock chamber, at the top of said load lock chamber, or at the bottom of said load lock chamber.
10. An assembly according to claim 1, wherein said load lock includes a thermal treatment device constructed and arranged to bring said object to a predetermined temperature or equalize said temperature across said object.
11. An assembly according to claim 10, wherein a said support plate of at least one of said at least two object supports is provided with said thermal treatment device.
12. An assembly according to claim 1, wherein two of said at least two object supports are placed one above the other, and wherein said thermal treatment device is positioned between said two of said at least two object supports.

13. An assembly according to claim 10, wherein said thermal treatment device comprises lines and a fluid pumping system constructed and arranged to pump fluid through said lines, said lines being arranged such that said lines are in thermal contact with said corresponding support plate.
14. An assembly according to claim 13, wherein said lines are provided internally in one of said support plate and a wall of said load lock chamber.
15. An assembly according to claim 1, wherein said load lock chamber comprises a top wall and a bottom wall, wherein a evacuation devices comprise an evacuation opening provided in the bottom wall of said load lock chamber, and wherein said load lock comprises a venting opening provided in said top wall of said load lock chamber.
16. An assembly according to claim 15, wherein said venting opening and said evacuation opening are arranged substantially centrally with respect to said object supports, said object supports being arranged one above the other.
17. An assembly according to claim 1, wherein said projection chamber is a vacuum chamber and wherein said lithographic projection apparatus comprises vacuum devices constructed and arranged to establish a vacuum in said vacuum chamber.
18. An assembly according to claim 1, wherein said projection apparatus comprises:
 - a radiation system constructed and arranged to provide a beam of radiation;
 - a support structure to support a patterning devices, said patterning devices serving to pattern said beam according to a desired pattern;
 - a substrate table for holding a substrate; and
 - a projection system constructed and arranged to project said patterned beam onto a target portion of said substrate.
19. An assembly according to claim 1, wherein said object is a semiconductor wafer.

20. An assembly according to claim 1, wherein said door device comprises a first door towards said first environment and a second door towards said second environment.
21. An assembly according to claim 1, further comprising two or more of said load locks.
22. A lithographic projection assembly, comprising
at least one load lock constructed and arranged to transfer an object between a first environment and a second environment;
an object handler comprising a handler chamber in which said second environment prevails, said object handler and said load lock being constructed and arranged to transfer said object between said object handler and said load lock; and
a lithographic projection apparatus comprising a projection chamber;
wherein said handler chamber and projection chamber can communicate for transferring of objects between said handler chamber and said projection chamber, and wherein said load lock comprises a load lock chamber which is provided with at least two mutually distinct object supports, and
wherein said object handler is integrated in said load lock, so that said handler chamber and said load lock chamber are a single unit.
23. A load lock for transferring a substrate between a first environment and a second environment and being constructed and arranged to maintain each of said first environment and said second environment therein, wherein said load lock comprises:
a load lock chamber which is provided therein with at least two mutually distinct substrate supports being positioned one above the other, each of said at least two mutually distinct substrate supports including a substrate displacement element;
an evacuation device constructed and arranged to evacuate said load lock chamber; and
a door device constructed and arranged to close said load lock chamber during evacuation and for opening said load lock chamber.

24. A load lock according to claim 23, wherein said second environment has a lower pressure than the first environment, and wherein said load lock chamber further comprises another evacuation device constructed and arranged to evacuate the load lock chamber.
25. A load lock according to claim 24, further comprising:
a substrate track system, wherein said door device faces said first environment and opens toward said wafer track system.
26. The method for transferring objects between a first environment and a second environment, the method using a load lock, the load lock having a load lock chamber, the method comprising:
positioning a first object, coming from the first environment on a first object support position inside the load lock,
closing the load lock in order to enclose the first object,
evacuating the load lock, by evacuation devices,
opening the load lock for connecting the load lock to the second environment, and
positioning a second object on a second object support position inside the load lock and removing the first object from the first object support position.
27. The method according to claim 26, the method subsequently comprising:
closing the load lock in order to enclose the second object,
venting the load lock,
opening the load lock in order to connect the load lock to the first environment, and
removing the second object from the load lock.
28. The method according to claim 26, wherein positioning the second object is performed before the removing the first object, and wherein both the positioning and removing are performed with the same gripper.

29. The method according to claim 26, comprising decreasing the volume of gas adjacent the first object positioned on the first object support position, prior to evacuation of the load lock.